

The present invention provides a polarization maintaining optical fiber of which polarization crosstalk characteristic is not deteriorated after fusing two or more polarization maintaining optical fibers, and provides a method for producing a preform thereof. The polarization maintaining optical fiber includes two stress applying portions disposed in a cladding around a core, in which an angle formed by a line connecting the center of one of the stress applying portions with the center of the core and a line connecting the center of the other stress applying portion with the center of the core is 3 degrees or less. The preform is produced by forming one insertion hole in a cladding element and then rotating the preform 180 degrees around a core element without moving the drilling tool, followed by forming the other insertion hole in the cladding element and then inserting stress applying elements into the insertion holes.